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Biological
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OCTOBER, 1917.

ENTOMOLOGICAL NEWS

Vol. XXVIII. No. 8

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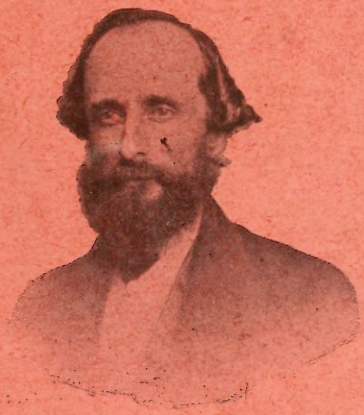

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PHILADELPHIA:
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter.

ENTOMOLOGICAL NEWS

published monthly, **excepting August and September**, in charge of the Entomological Section of The Academy of Natural Sciences, Philadelphia, and The American Entomological Society.

ANNUAL SUBSCRIPTION, $2.00 IN ADVANCE.

SINGLE COPIES 24 CENTS.

Advertising Rates: Per inch, full width of page, single insertion, $1.00; a discount of ten per cent. on insertions of five months or over. No advertisement taken for less than $1.00—Cash in advance.

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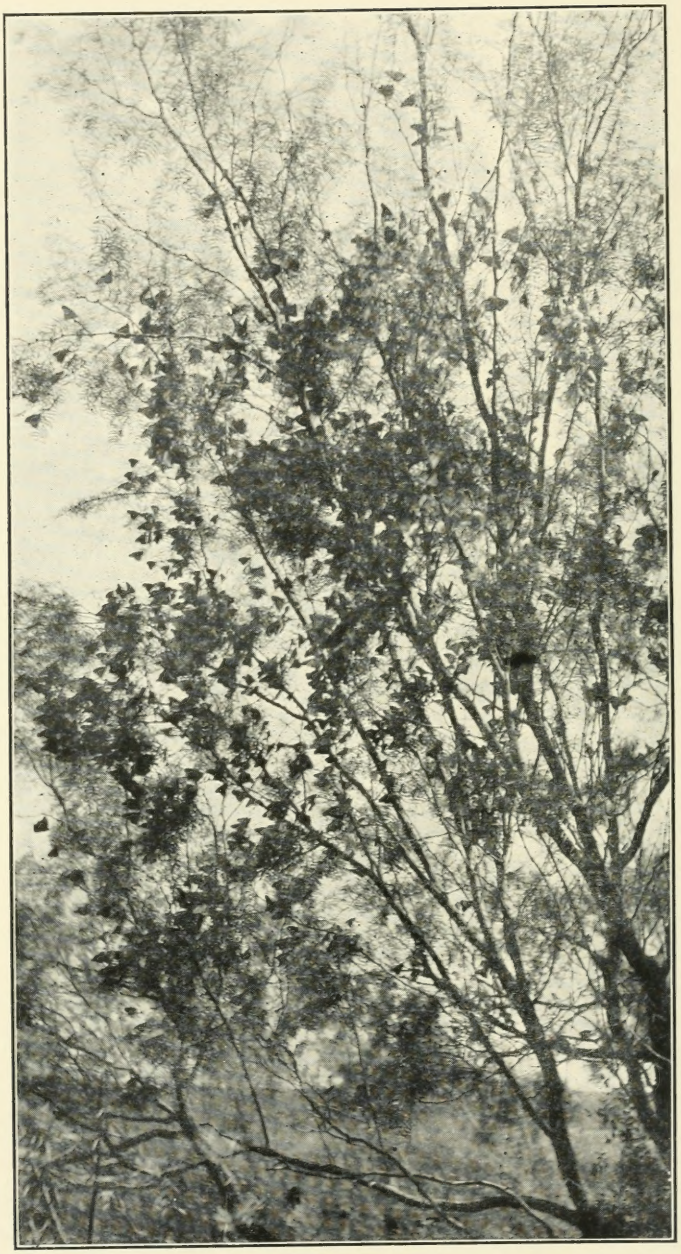

SWARMS OF THE MONARCH BUTTERFLY—BERNHEIM.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXVIII. OCTOBER, 1917. NO. 8.

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Swarms of Butterflies (Lep.).

By JAMES L. BERNHEIM, Corporal, Band, Third U. S. Infantry.

(Plate XXIV.)

On September 4, 1916, and for several days following, near Eagle Pass, Texas, the air was fairly alive with swarms of *Libythea bachmani* (Snout butterfly), which were flying toward the north. They occupied a strip about a mile wide eastward from the Rio Grande, in which region the vegetation is most abundant.

They extended upward as far as the eye could reach, and, borne by a mild breeze from the south, were moving quite swiftly. During this time I made several collecting trips south of Eagle Pass and at each step stirred up veritable clouds of this interesting butterfly which immediately rose in the air and started north. There were literally millions of them and many

of them had evidently completed their allotted span of life as they were dropping from the air in large numbers.

One particular specimen flew past, almost brushing my face, and, as I thought, alighted upon the ground. As I stooped to examine it the wings suddenly folded down tightly in front of the body and I picked the insect up quite dead.

Late in October, while collecting east of Eagle Pass, I came upon a small pond upon the banks of which grew several quite large mesquite trees. These trees were almost covered by swarms of Monarchs (*Anosia plexippus*). They remained until the following day, when nearly all of them left within an hour or so.

Two days later the willows growing upon the bank of the Rio Grande were the resting place for a still larger swarm, some of which remained several days. I enclose a picture showing one of the trees.

Descriptions of new Genera and Species of the Dipterous Family Ephydridae—IV.

By E. T. Cresson, Jr., Academy of Natural Sciences of Philadelphia.

CEROPSILOPA n. gen.

A fairly well marked genus closely allied to *Psilopa* but evidently distinct; apparently belonging to a group containing the oriental *Rhynchopsilopa* Hendel. The sub-pendent nature of the antennae, with the second and third joints apparently suspended from the exserted first, is very characteristic, as is also the hair-like apical spine of the second joint. *Psilopa longicornis* Meijere and several undescribed species from the Orient also belong here or to allied genera.

Description.—Head broad and high. Eyes bare. Frons broad with ocellar tubercle situated at the sharp vertex; ocellar bristles situated between the post-ocelli; the proclinate orbitals and generally the reclinate frontals present. Face narrowed at middle, convex to nearly carinate, not excavated at antennae; epistoma retreating. Antennae decumbent; second joint without apical production, but with or without the hair-like

spine; third long and slender; arista with long hairs above. Mouth small; clypeus exserted. Cheeks with distinct bristle. Mesonotum strongly convex; setulae distinctly seriated. Scutellum normal. Wings with costa attaining fourth vein.

Genotype.—Ceropsilopa nasuta n. sp.

Ceropsilopa nasuta n. sp.

Black; second antennal joint, apical half of fore femora, entire fore and middle tibiae, apical three-fourths of hind tibiae and all tarsi, tawny. Halteres white. Wings and veins yellow. Shining to polished, with violet reflections on face and abdomen. No sculpturing on face. Face strongly keeled on lower part, in profile most prominent at middle. Antennae as long as face, first joint nearly as long as second, second with very short spine, third four times as long as second with very long arista. *Length.*—3.75 mm.

Type.— ♀ ; Port of Spain, Trinidad (Ujhelyi). [Hungarian Nat. Museum.] *Paratype.*—1 ♀ ; topotypical.

Hydrellia tibialis n. sp.

Black; halteres white. Wings hyaline. Shining; frons opaque; face and lunule white; mesonotum subopaque with brownish dust; pleura and pectus opaque. Mesonotum with one pair of dorso-centrals situated near suture. Middle tibiae of male enlarged and thickened, as broad as femora. *Length.*—1.9 mm.

Type.— ♂ ; Moscow, Idaho, October 9, 1907 (J. M. Aldrich). [A. N. S. P., No. 6141.] *Paratype.*—1 ♀ ; topotypical.

Scatophila variabilis n. sp.

Black; halteres white. Wings faintly brownish becoming diluted inferiorly, with clear spots as follows: a large one in submarginal above post. c. v. and one at apex of the cell, two in first posterior beyond post. c. v., a large one each side of post. c. v., and one below apex of fifth vein. Opaque, at most slightly shining, generally brownish- or grayish-dusted. Frons greenish anteriorly. Face and cheeks densely white. Mesonotum with gray or greenish stripes as follows: two medianly, abbreviated posteriorly, one laterad of dorso-centrals, abbreviated anteriorly, and one on each lateral margin. Scutellum grayish with white apical spot. Face with two or three bristles each side which are curved dorso-laterally. *Length.*—2 mm.

Type.— ♂ ; Berkeley Hills, Alameda County, California, April 11, 1909 (E. T. Cresson, Jr.). [A. N. S. P., No. 6140.] *Paratypes.*—27 ♂, 30 ♀ ; topotypical.

There is a possibility of this being conspecific with the European *despecta* Haliday, but I am unable to compare specimens.

A new Species of Tropidia (Syrphidae) from Montana (Dipt.).

By H. L. SEAMANS, Bozeman, Montana.

In the Syrphid collection of the Montana Experiment Station there were several specimens of this insect all collected in Bozeman, on June 20, 1906. There are no notes concerning this particular collection, nor have any specimens been located in all the material collected since that time in the vicinity of Bozeman. In 1916, specimens of this fly were sent to Chas. W. Johnson, at Boston, who determined it as a new species of *Tropidia* and returned the specimens to this office. Since that time no species of *Tropidia* has been described, so far as is known, which corresponds to this one. Though it runs near *quadrata* in the key to the species of *Tropidia* published by Hunter, in Entomological News (Vol. 7, p. 215), it is entirely different and can be readily separated from that species.

The following description was made from two type specimens, one of each sex, and 18 paratypes, nine of each sex, all perfect specimens. In honor of Prof. R. A. Cooley, of the Montana Experiment Station and State College, the name of *cooleyi* is suggested for this species.

Tropidia cooleyi sp. nov.

Front in both sexes golden sericeous except for keel of carina, and oral margin, which are shiny black; vertex darker than front, covered with a long, dark pile; cheeks and occiput with covering of yellow pile; antennae black, or brown sericeous, first and second segments each with one or more small spines, third segment rounded. Carina of male more acute than that of female, which appears as a rounded, almost globular protuberance below the antennae.

Dorsum of thorax for the most part black, with a narrow median stripe of gray flanked by two broader bands of gray extending almost or quite to the scutellum, and with gray bands bordering the pleura; entire thorax covered with golden yellow pubescence. Scutellum shining black, or with tip ochraceous.

Abdomen black, sparsely covered with yellow pile; sometimes in females with two more or less distinct grayish spots on second segment.

Legs black; all knees yellow or ochraceous; hind tibia, and sometimes middle tibia with distinct ochraceous band about the middle; hind femur with distinct depression on anterior face near distal end; and equipped at lower distal portion of this depression with a distinct row of short, black spines in the female, and from one to five spines in the male; all legs covered with yellow pile.

Wings hyaline, projecting a short distance beyond the tip of abdomen.

Length from 6 to 7.5 mm.

Sarcophaga haemorrhoidalis Larvae as Parasites of the Human Intestine (Dipt.).*

By L. Haseman, Columbia, Missouri.

Dipterous larvae play a much more important role as parasites of man than is generally supposed. Numerous records are available showing some of the most important types of myiasis, but many cases are never brought to the attention of the medical profession at all. Leuckart in his "Parasites of Man" refers to cases of intestinal myiasis caused by the larvae of *Anthomyia* and to the parasitic work of *Musca vomitoria* and *Sarcophaga carnaria* in neglected wounds. Riley and Johannsen in their "Medical Entomology" review briefly a number of cases of myiasis in man. Intestinal myiasis seems to be due in most cases to the so called rat-tailed maggots (*Eristalis*), the larvae of Anthyomyiidae, Muscinae and Sarcophagidae. Myiasis of the urinary tract is apparently due in most cases to larvae of *Fannia*. In recent years the writer's attention has been called to three cases of intestinal myiasis due to rat-tailed maggots, one due to the larvae of *Sarcophaga haemorrhoidalis*, and one case of myiasis of the urinary tract in which two *Fannia* larvae were passed by a small boy, one of which pupated and later emerged as the adult. The case of intestinal myiasis due to the larvae of *Sarcophaga haemorrhoidalis* has proven to be a most unusual one.

In the summer of 1915, the writer received through Dr. Jones, State Bacteriologist, a vial of preserved dipterous larvae from Dr. A. L. Lewis, of Sumner, Missouri, who reported that they had been passed by a patient. The writer asked Dr. Lewis to send living material for breeding if he succeeded in securing additional specimens and to make sure about the original source of the larvae. This request was later complied with, but the larvae were dead, having been sent in a stoppered bottle. In July, 1916, Dr. Lewis secured another supply of the larvae, which he kept in a breeding cage until they pupated and later emerged as adult flies. These were received in July

*Read at the New York meeting of the Entomological Society of America, Dec., 1916.

and samples were forwarded to the Bureau of Entomology and Dr. Aldrich identified them as *Sarcophaga haemorrhoidalis*.

In order to learn more about the case, the writer went to Sumner to consult further with Dr. Lewis and to interview the patients. The family, consisting of husband, wife, daughter and son, moved to Sumner in 1914 and since that time Dr. Lewis attended them. The husband was a strong, active man; the wife was slight but active and somewhat nervous; the daughter of nine and son of six were strong, healthy children inclined to outdoor life. The husband had never been affected to his knowledge, but the wife had had attacks each summer for the past six years excepting 1916. The daughter had had a number of attacks, including one in 1916, at which time she passed the larvae which were bred for determination. The son had had one attack when about three years old. The husband's work called him from home most of the time during the summer and the wife was inclined to leave food on the table from meal to meal and to serve cold meals.

The home surroundings were found to be similar to those of the average home in a small country town. The house was a small cottage, screened and in average condition as regards repairs. The front yard was small and densely shaded by soft maple trees. The lot extended back some two hundred feet to a railroad. The family drank well water and in the garden was an open closet. The wife seemed to be a neat housekeeper, but had the reputation of being negligent about the cooking and handling of foods.

So far as it was possible to determine, the diet of the family was well balanced. Considerable meat was used, but not to excess. Cooked vegetables were commonly used cold for supper and cold prepared meats were also extensively used. Cheese was also used in considerable quantities. There seems to have been nothing unusual as regards the type of food or its preparation which would explain the reason for the repeated ingestion of the maggots, unless it be the fact that cold vegetables and cold prepared meats were more or less regularly used during the summer. The fact that during the spring, summer and fall of 1916 the advice of Dr. Lewis to warm

up all meats and vegetables immediately before eating them, was strictly followed, with the result that the mother escaped the pests and the daughter had only one light attack, would seem to show that the use of exposed cold foods was responsible for the trouble.

The larvae are undoubtedly ingested, though it is difficult to explain why this one family should continue to have trouble when many other families in the same community handle food in the same way without having trouble with the pest.

The possibility of the maggots entering the stomach by being deposited by the fly about the mouth or nostrils seems remote. The members of the family had not had catarrh troubles or faulty teeth, which might serve to attract the parent fly, and they had not practiced sleeping out of doors or otherwise exposed to the fly.

The trouble has been worse during the heat of the summer, though it has, in cases, occurred early in June and as late in the fall as October. The greatest trouble comes when the flies would be expected to be most abundant.

The first signs of trouble are noted a day or more previous to the real attacks or the time at which medical aid is required. In the base of the stomach or in the region of the transverse colon a sensation similar to a rolling mass is felt. Later this changes to griping which is accompanied by some fever and in some cases by nausea. In case of the mother this is followed by much nervousness and at times by spasms. After medical assistance is given and the maggots are passed, the temperature falls, though in case of severe attacks pain in the bowels continues for some time and may not entirely disappear until another attack comes on. The maggots may not all be passed at one time and usually mature as well as immature larvae are passed at the same time.

In one case, before the family moved to Sumner, the mother was placed on a grape-nuts diet for a month and throughout that period trouble continued and larvae were passed. Grape-nuts without milk or sugar and only boiled water were used. Sugar or other sweets had the effect of bringing on cramps and a regular attack. This experience led the patient to the

erroneous assumption that the larvae were reproduced in the stomach or intestines and not ingested from time to time. From the fact that larvae were passed for a month when there was no chance of ingesting new supplies, would lead one to conclude that the larvae may remain in the alimentary canal for a considerable length of time.

The peculiar rolling motion is undoubtedly the crawling of the mass of mature larvae seeking to escape. The eating of sugar or other sweets probably aggravates the larvae and causes them to move about in an attempt to escape. The severe attacks are usually followed by the passing of large numbers of maggots. The patient estimated the quantity of maggots at fully a cup-full in severe cases.

Since the trouble is undoubtedly due to repeated ingestion of living larvae—the fly deposits larvae rather than eggs—the protection of food or the heating of meats and vegetables immediately before eating them should give complete relief. Once the larvae are present in the alimentary canal, the taking of salts, oil, or other laxatives results in the discharge of the larvae. The calling of a physician was usually delayed until the last moment and in some cases the injection of an opiate was necessary.

A laxative taken as soon as the presence of the maggots in the stomach is noted would probably relieve much of the later trouble. The larvae are not affected either by salts or oil, but both the mature and immature larvae are alive when passed. The necessary oxygen is undoubtedly secured from the food or the air taken in with the food.

While it has not been possible to determine definitely just how the larvae enter the alimentary tract of the patient, it seems that they are undoubtedly ingested from time to time on exposed cold and perhaps partly spoiled meats or vegetables. They may remain in the alimentary tract several days and when they are mature or approach maturity they bring on severe cramping and in some cases spasms. Relief comes after they have been discharged. The family will be kept under observation in order to determine more definitely how the larvae are taken in and how long they feed in the alimentary tract.

A List of the Butterflies of Iowa.

By A. W. Lindsay, Iowa City, Iowa.

In preparing a review of the butterflies of Iowa the writer has had occasion during the past few months to examine most of the collections now in existence in the State and the local lists heretofore published. After examining the collection on which the most extensive of the latter was based it was very evident that records could not be taken from these lists without verification and that the literature previously sent out from the State was deplorably inaccurate. The work of compiling this list has therefore been carried on with two things in mind; first, the examination of all material obtainable in the State and second, the correction of such errors as have been published in the several local lists used.

The collections examined represent the work of from one to thirty years, and in most cases are fairly complete for the localities which they represent. They are in the possession of the following persons and institutions and were made in the neighborhood of the towns where they now repose.

(1) Mr. A. F. Porter, Decorah, Ia.

(2) Mrs. J. E. Hoopes, Muscatine.

(3) Prof. H. F. Wickham, Iowa City.

(4) Dr. G. L. Stempel, Macedonia.

(5) Coe College, Cedar Rapids.

(6) Grinnell College, Grinnell.

(7) The writer's collection made in Woodbury and Dickinson Counties.

In addition to these, lists have been furnished by Mrs. O. F. Hiser, Nevada, Ia., and Mr. F. M. Holmes, Prescott, Ia., and Mr. R. L. Mayhew, of Decatur, Illinois, has contributed the records which he made at Mount Pleasant, Ia. Assistance has been given by Dr. Henry Skinner, Dr. J. McDunnough, Dr. H. G. Dyar, Mr. Nathan Banks and Mr. R. A. Leussler in determining specimens and clearing up some obscure points of classification. As the list is presented here it follows the nomenclature given in Dyar's "List of North American Lepidoptera."

1. **Iphiclides ajax** Hüb. Bred in eastern and southern Iowa, very rare in the northwest. April to July.
1a. **I. ajax,** var. **marcellus.** Boisd.-LeC.
2. **Papilio glaucus** Linn. Rather rare in the northern parts, more common southward. May and August.
2a. **P. glaucus,** var. **turnus** Linn. April to September. Common everywhere.
3. **Papilio troilus** Linn. Rare in eastern and southern Iowa.
4. **Papilio thoas** Linn. Fairly common, June to September. Distribution general.
5. **Papilio polyxenes** Fab. Fairly common, May to September. Distribution general.
6. **Laertias philenor** Linn. Rare. Occasionally breeds in eastern and southern Iowa. April to July, October.
7. **Pontia protodice** Boisd.-LeC. Common throughout the warm months. Distribution general.
7a. **P. protodice,** var. **vernalis** Edw. Rare.
8. **Pontia rapae** Linn. Very abundant everywhere during all the warm months.
8a. **P. rapae,** var. **immaculata** Skinner and Aaron. Rare.
9. **Nathalis iole** Boisd. Fairly common everywhere. July to October.
10. **Callidryas eubule** Linn. Occasionally common. August and September. Distribution general.
11. **Zerene caesonia** Stoll. May to October, common after July. Distribution general.
11a. **Z. caesonia,** var. **rosa** McNeill. Rare during September.
12. **Eurymus eurytheme** Boisd. Common in all parts of the State from May to October. Albino females fairly common.
12a. **E. eurytheme,** form **eriphyle** Edw. Fairly common during the late summer.
12b. **E. eurytheme,** form **keewaydin** Edw. Fairly common during the early summer.
13. **Eurymus philodice** Godart. Very common, May to Oct. Distribution general.
14. **Pyrisita mexicana** Boisd. Found in all parts of the State but the northeast. Very rare. July to Oct.
15. **Eurema nicippe** Cramer. Rare in southern Iowa and along the Mississippi. June.
16. **Eurema euterpe** Ménétries. Fairly common throughout the State. July to Oct.
17. **Agraulis vanillae** Linn. Two specimens in Mr. Porter's collection are the only ones located, though the species is undoubtedly to be found in the southern part of the State. The two were taken late in June.

18. **Euptoieta claudia** Cramer. Common everywhere from May to Oct.
19. **Speyeria idalia** Drury. Fairly common from the middle of June to Oct. Distribution general.
20. **Argynnis cybele** Fab. Abundant. Flies from June to Oct. Distribution general.
21. **Argynnis aphrodite** Fab. A few specimens have been seen in eastern Iowa. The only dates available are from July 10-25.
21a. **A. aphrodite,** var. **alcestis** Edw. Fairly common throughout the State, apparently displacing *aphrodite* in the western half. June to Oct.
22. **Brenthis myrina** Cramer. May to Sept. Distribution general. Rare in northwestern Iowa, but fairly common in other parts.
23. **Brenthis bellona** Fab. Fairly common in the northern half of the State only. May to Aug.
24. **Euphydryas phaeton** Drury. Accepted on the authority of Prof. Herbert Osborn ("A Partial Catalogue of the Animals of Iowa," Ames, 1892) and Dr. Stempel. Said to occur in southeastern Iowa. Rare. No dates recorded.
25. **Charidryas nycteis** Doub.-Hew. Common in all parts of the State. May to Aug.
26. **Charidryas ismeria** Boisd.-LeC. May to Sept. Distribution general. Fairly common.
27. **Phyciodes tharos** Drury. Fairly common in May. Taken in all parts of the State.
27a. **P. tharos,** var. **morpheus** Fab. Same distribution. Very common from June to Oct.
28. **Phyciodes batesii** Reakirt. Rare. Two specimens which are undoubtedly *batesii* were taken at Sioux City in June, 1909 and 1915. The species must be present in the eastern part of the State.
29. **Mestra amymone** Ménétries. A single stray, not dated, taken by Dr. Stempel near Macedonia, is the only record of this species.
30. **Polygonia interrogationis** Fab. Fairly common. June and July. Distribution general.
30a. **P. interrogationis,** var. **umbrosa** Lintner. Common.
31. **Polygonia comma** Harris. Very common during the warm months. Found throughout the State.
31a. **P. comma,** var. **dryas** Edw. This variety makes up a part of the summer brood of *comma* and is found from June to Aug.
32. **Polygonia progne** Cramer. Rare. Distribution general. Aug.
33. **Eugonia j-album** Boisd.-LeC. Southeastern Iowa. Rare. The

only dates available are July 10-25, 1869. (Scudder, Trans. Chicago Acad. of Sciences, 1869).

34. **Euvanessa antiopa** Linn. Early spring, June and July, and from late August until cold weather. Fairly common. Distribution general.

35. **Aglais milbertii** Godart. One specimen was seen in Plymouth County in July, 1909.

36. **Vanessa atalanta** Linn. Very common everywhere throughout the warm months.

37. **Vanessa huntera** Fab. Fairly common in all parts of the State. May to Oct.

38. **Vanessa cardui** Linn. Usually very common. Found in all parts of the State during the warm months.

39. **Junonia coenia** Hüb. Rare. June to Sept. Distribution general.

40. **Basilarchia astyanax** Fab. Common in all parts of the State from June to Sept.

41. **Basilarchia archippus** Cramer. The same things may be said of this species, though it is somewhat less common.

42. **Chlorippe celtis** Boisd.-LeC. Very common from June to Sept. Distribution general.

43. **Chlorippe clyton** Boisd.-LeC. June to Sept. This species is less common than *celtis,* but is found wherever its food plant grows.

43a. **C. clyton,** var. **proserpina** Scud. Fairly common among the adults emerging late in the season. Most of the specimens from the northern part of the State are dark inter-grades rather than typical *clyton* or *proserpina.*

44. **Anaea andria** Scud. Two undated specimens at Macedonia are the only ones seen in the State.

45. **Cercyonis alope** Fab. Rare in southeastern Iowa. July and Aug.

45a. **C. alope,** var. **nephele** Kirby. Common everywhere during July and August.

46. **Enodia portlandia** Fab. Sometimes very common. June to Sept. Distribution general.

47. **Satyrodes canthus** Linn. Rare. Taken throughout the State. June and July.

48. **Cissia eurytus** Fab. Common everywhere from June to Aug.

49. **Anosia plexippus** Linn. Common throughout the warm season in all parts of the State, and sometimes extremely abundant.

50. **Anosia berenice,** var. **strigosa** Bates. A single female has been reported from Cass County, taken on Aug. 31. (Mr. F. C. Pellett. Proc. Ia. Acad. Science, XXI, 347, pl. xxxvi).

51. **Hypatus bachmanni** Kirtland. Found during July in the southern part of the State, but rather uncommon.
52. **Hypatus carinenta** Cramer. Strays of this species reach even the northern and eastern parts of Iowa occasionally, appearing in Aug. and Sept.
53. **Uranotes melinus** Hüb. Rare. Aug. to Oct. Distribution general.
54. **Thecla acadica** Edw. Fairly common in the southern half of the State and occasionally found in the northeast. June.
55. **Thecla edwardsii** Saunders. Recorded at Sioux City in July. Rare.
56. **Thecla calanus** Hüb. Common all over the State in July.
57. **Thecla liparops** Boisd.-LeC. Very rare. A few specimens reported from Story, Pottawattamie and Franklin Counties. July.
58. **Incisalia henrici** G. & R. Five specimens in the collection of Dr. Stempel. May.
59. **Strymon titus** Fab. Rare. Distribution general. July.
60. **Feniseca tarquinius** Fab. Recorded at Decorah alone. Rare.
61. **Gaeides dione** Scud. Rather uncommon. July. Distribution general.
62. **Chrysophanus thoe** Boisd. Fairly common. July and Aug. Distribution general.
63. **Epidemia helloides** Boisd. Taken in the northern part of the State in June and July. Uncommon.
64. **Heodes hypophleas** Boisd. Common in southeastern Iowa. July to Oct.
65 **Rusticus melissa** Edw. Very common in Dickinson County and ranging east in small numbers to the Mississippi. June to Sept.
66 **Cyaniris ladon** Cramer. Fairly common from June to Sept. Distribution general.
66a. **C. ladon,** var. **violacea** Edw. Spring form, appearing in Apr. and May.
66b. **C. ladon,** var. **neglecta** Edw. Summer form. Aug. and Sept.
67. **Everes comyntas** Godart. Common throughout the State. May to Oct.
68. **Hemiargus isola** Reakirt. Fairly common in western Iowa, extending east to Linn County. July to Sept.
69. **Amblyscirtes vialis** Edw. Distribution general. May to July. Fairly common.
70. **Amblyscirtes samoset** Scud. Eastern Iowa in June and July. Rare.
71. **Ancyloxypha numitor** Fab. June to Sept. Distribution general. Common.

72. **Oarisma poweshiek** Parker. Recorded in Story, Dickinson and Poweshiek Counties in July. Rare.
73. **Poanes massasoit** Scud. Taken in Poweshiek and Story Counties. Rare. No dates.
74. **Atrytone hobomok** Harris. Fairly common in all parts of the State during late May and early June.
75. **Erynnis comma,** var. **colorado** Scud. Very rare. Mr. Porter has taken three specimens at Decorah.
76. **Erynnis pawnee** Dodge. Rare. Taken in Poweshiek and Woodbury Counties in Aug. and Sept.
77. **Erynnis sassacus** Harris. Crawford County, mid-July, one male. (Scudder, Trans. Chicago Acad. of Sciences, 1869).
78. **Anthomaster leonardus** Harris. Audubon County in Sept., Scott and Winneshiek Counties. Very rare.
79. **Hylephila campestris** Boisd. Rare. June to Sept. Distribution general.
80. **Thymelicus mystic** Scud. Taken in June. Rare. Distribution general.
81. **Thymelicus cernes** Boisd.-LeC. Common in all parts of the State. May to Aug.
82. **Thymelicus otho,** var. **egeremet** Scud. Fairly common during July. Distribution general.
83. **Polites peckius** Kirby. Common everywhere. Flies from May to Sept.
84. **Euphyes verna** Edw. Occurs in small numbers in most of the collections seen. June and July.
85. **Euphyes vestris,** var. **metacomet** Harris. Fairly common everywhere. July and Aug.
86. **Lerema hianna** Scud. Very rare. A few Iowa specimens are in the collection at Grinnell. No dates.
87. **Limochroes bimaculata** G. & R. There are two females labelled "July 4, 1890. Poweshiek Co." in the Grinnell collection.
88. **Limochroes pontiac** Edw. Southeastern Iowa in July. Rare.
89. **Limochroes manataaqua** Scud. Two males and one female taken at Sioux City in early July are the only specimens seen by the writer.
90. **Phycanassa vitellius** Fab. Rather rare throughout the State. July.
91. **Phycanassa arogos** Boisd.-LeC. Throughout the State in July. Fairly common.
92. **Epargyreus tityrus** Fab. Common. June to Sept. Distribution general.
93. **Thorybes bathyllus** S. & A. Rare in the Mississippi valley. No dates.

94. **Thorybes pylades** Scud. Common everywhere in June and July.
95. **Pholisora catullus** Fab. Common everywhere. June to Sept.
96. **Pholisora hayhurstii** Edw. Very common in the northwest. Collections in the southern half of the State show a surprising absence of this species. June to Sept.
97. **Thanaos brizo** Boisd.-LeC. One specimen at Muscatine. It is reported from Omaha, Nebraska, as occurring rarely in April and May (Mr. R. A. Leussler, Ent. News XXIV, 352, 1913) and so may be expected in southwestern Iowa.
98. **Thanaos persius** Scud. Rare. Distribution general. May to July.
99. **Thanaos martialis** Scud. Fairly common. Distribution general. Occurs in July.
100. **Thanaos juvenalis** Fab. Common. May to Sept. Found throughout the State.
101. **Thanaos horatius** Scudder and Burgess. Rare. There are a few specimens at Grinnell and two taken at Sioux City in the writer's collection. The latter were taken on June 23 and July 24.
102. **Hesperia montivaga** Reakirt. Very common in all parts of the State from May until late fall.

In presenting this list the writer wishes again to emphasize the fact that no records are used without adequate proof of their accuracy. The two exceptions are, it seems, amply explained. Where doubtful specimens have come to hand they have been referred to authorities. Thus the list has been made as complete and as accurate as possible and it is now offered to the world as a contribution from the Lepidopterists of the State of Iowa.

Medal Awarded for Entomological Research.

The Crisp Medal and an award of £30 by the Council of the Linnean Society of London have been bestowed upon Mr. R. J. Tillyard (not Hilliard as incorrectly announced in *Science* for July 14, 1917), Linnean (New South Wales) Macleay Fellow in Zoology, acting lecturer and senior demonstrator in zoology at the University of Sydney, New South Wales. The award is given once every five years to a fellow of the Linnean Society for the best piece of microscopic research published by the Society, in this case a paper entitled "A Study of the Rectal Breathing Apparatus in the Larvae of Anisopterid Dragonflies (Journ. Linn. Soc. Lond. xxxiii, 127-196, pls. 18-22, 21 text figs. Nov., 1916). Mr. Tillyard is the author of many other papers, chiefly dealing with Australian Odonata, and of a book just published at the University Press, Cambridge, England: "The Biology of Dragonflies (Odonata or Paraneuroptera)," 1917, which we hope to review in a later number of the NEWS.

Life History of the Northern Microvelia—Microvelia borealis Bueno (Hem., Het.).

By J. R. de la Torre Bueno, New York City.

(Plate XXV.)

Every miniature Sargasso sea of matted algae floating their green meshes on still pools, every field of duck-weed in mill ponds, affords shelter to a myriad forms, to a teeming busy population, some preyed upon, others predators. Swarming over these moist fields one finds a series of water-bugs—Acanthias, Mesovelias, Naeogeids, Veliids. One species of the last-named family is perhaps the most abundant of all.

For many years this little Microvelia masqueraded in our catalogues and lists as *Microvelia pulchella* of Westwood, which was described originally from St. Vincent's. At last it became possible to fix its status definitely and it was described as new in 1916 under the name *borealis*.[1] The paper in which it was described cleared up the synonymy and distribution of this group of atoms and fixed the name of the present species thus:

Microvelia borealis Bueno
=*pulchella* Uhl.?, Bueno, Heid., Van D., nec Westwood.
=*boreale* Bueno, in various lists.
=*marginata* Kirk. & Bueno, nec Uhl.

Probably owing to not having seen the paper in question, the synonymy of our Eastern species in Van Duzee's new Check List leaves much to be desired.

Microvelia borealis has a limited range, so far as known to me, doubtless because little collected. I have taken it in this State and New Jersey, and Parshley has got it from Maine. It must be very widely distributed, but being so small it is unnoticed, or else taken for an immature bug on account of its generally apterous condition and small size.

Microvelia borealis awakes from its winter sleep some time in the spring, how early I am unable to say, as I have never taken it before May, when it begins to populate the watery

[1] Bueno, Bull. Brooklyn Ent. Soc. XI: 57.

MICROVELIA BOREALIS—Bueno.

wastes of the ponds. Nymphs appear early, and have only four molts, a fact repeatedly tested under varying conditions. This is specially noteworthy, as the general rule in the Heteroptera thus far observed is five molts, exceeded when there is variation and equaled in the single instance known to me, of *Riptortus linearis,* one of the Alydids of India, as recorded by Kirkaldy and Kershaw.[2]

When the species was first bred in 1904 I thought there was some error in counting the molts. It was again raised in 1905, with the same result. Finally, in 1908, it was once more bred under carefully controlled conditions; a batch of ova was separated in a small aquarium, and as each nymph emerged it was separated in a small Stender dish. A careful record of the dates of molting was kept on its ground glass cover as well as in my note book. My previous results were fully confirmed.

The complete transformations in my aquaria took place in varying periods of from 22 to 59 days for the full cycle from oviposition to adult, or from 14 to 49 days for the nymphal instars. However, the majority run between 14 and 18 days for the nymphal instars, or somewhere between 22 and 25 days for the period from oviposition to maturity. Neither the sex nor the period of the summer seems to make any difference in the developmental period. In midsummer the molts are between 3 and 5 days apart, the maximum for any one molt being 11 days and minimum 2, but no one instar seems to take longer than any of the others *per se.* During the summer, broods overlap, as oviposition is continuous, and taking four weeks as an average, it makes possible say five to six generations in a season, from early May to late September.

As the days grow colder in late summer and early fall they begin to grow less in number, and finally they disappear for the winter. However, under favorable climatic conditions, this species may breed throughout the year. A few were kept in an aquarium through one winter. It was near a window, and the room being in a steam-heated apartment was warm. They

[2] 1908 J. C. Kershaw and G. W. Kirkaldy, Tr. Ent. Soc. Lond., pp. 59-62 "On the Metamorphosis of Two Heteropterous Hemiptera from Southern China," pls. iv and v.

bred and the young emerged in due course. The aquarium swarmed with waterfleas; as there was no other food the Microvelias doubtless fed on the many Daphnias entrapped in the surface film. By the end of the following April there were nine adults in the aquarium and a very few nymphs.

This little species feeds on dead or waterlogged insects in the water, which it attacks in numbers, as observed in these experiments. Its small size prevents it from successfully coping with living insects larger than itself.

The chief structural peculiarities that distinguish it from the other species, aside from its small size and antennal characters, are the nearly orbiculate shape of the apterous female and the curved posterior tibiae of the male. It is most frequently found apterous, but the winged form is not rare. It walks ordinarily in little staccato steps, although at times it runs, especially when pursued off the duckweed into the open pond, when it races out and curves rapidly back. Its habits in general are like those of *Microvelia americana,* elsewhere[3] described, as well as the details of breeding, preparing for the microscope, etc.

No parasites of *Microvelia* appear to be known. Its internal anatomy is also to be studied.

The *egg* is clear pearly glistening white when just deposited; elliptical; about one and one-half times as long as broad. The chorion is apparently smooth seen under a low power (x60), but under a higher (x320) appears rather sparsely punctulated in lines. Size (from freshly deposited eggs) long., .45mm.; lat., .3 mm. This is an average dimension, as it sometimes varies quite markedly.

As development progresses, the egg grows darker and shortly before emergence the folded up embryo is visible through the translucent chorion. As already noted, the eggs are deposited on the under surface of duckweed, the head end generally pointing to the edge, although if this plant be not available they will deposit them anywhere, embedded in a clear waterproof jelly or glue secreted by the female for this purpose. The females carry two mature ova at a time, which seem to practically fill up the entire body cavity. In hatching, the egg splits along a straight line 4-7 of its length and through this the nymph escapes. Although looked for, no casting of the amnion or

[3] 1910, Bueno, Can. Ent. vol. xlii, 176-186, "Life Histories of American Water Bugs, iii, Microvelia americana."

molt on emerging has been observed. The embryonic period has been noted as lasting from 7 to 23 days, but the controlled lot took only the former time, and the majority took only 8 days for development.

Nymph, First Instar.—Antennae rather stout but long, joint 4 longest, 2 and 3 shortest and equal, 1 slightly longer; 2 and 4 stoutest, 4 fusiform, 3 pedicellate at base expanding to tip, club-shaped. Eyes small, round, set very far apart owing to broad head. Rostrum stout, joint 2 shortest, 3 longest, then 4, then 1, which is stoutest, 2 is ring-like, 3 is more or less long ovoid, 4 slenderest, pointed tapering. All legs are equally stout and comparatively long; all tarsi are 1-jointed, all tibiae have combs at the distal end. Fore tibiae shorter and stouter than femora; tibia and femur of intermediates subequal; hind tibiae longer than femora, which have slender long spines or stiff hairs. Tarsal claws long, slender, simple.

The little bugs have a family resemblance to the adult—they are rounded posteriorly and the legs and antennae are much thicker in proportion than in the adult. The abdomen is comparatively short and the legs in consequence appear set very far back. When fully set, the nymph is very dark, a deep slate grey. In molting, the entire top of the head lifts off like a lid hinged at the clypeus, and the skin splits from the thorax through the abdomen.

In this and the succeding instars, much of the descriptions has been taken from balsam mounts and from cast or molted skins.

The first instar lasted from 2 to 11 days, the controlled brood took 6.

Nymph, Second Instar.—In this instar the second antennal joint is the shortest, 4th longest and stoutest, nearly as long as the other three taken together, and 1st and 3d equal. The rostrum is as before, except that joint 2 is narrower and more ring-like, joint 3 longest, but little longer than 4 and twice as long as 1. The abdominal segments are ring-like, telescoped; the abdomen is very short and truncate, but comparatively longer than in the preceding instar, so the legs do not appear set so far back. The legs are as before, except that the femora of the second pair are longer than the tibiae. The molt is as in the preceding instar.

The second instar lasts between two and six days, the majority taking 3 or 4 days.

Nymph, Third Instar.—The antennae continue as before proportionally, but the second joint is but slightly shorter than the 1st and 3d and the 4th is one-fifth shorter than the other three taken together; joint 3 is slenderest, but all are nearly of equal thickness. Rostrum as before. The legs are slenderer but otherwise as before; the second and third tibiae are slenderer than the femora. The chief visible changes are in the proportions of thorax and abdomen, which is much longer actually and comparatively, and the segments are more distinct.

Microvelia borealis Bueno. Tabulated Life Histories (Record of 14 Bred Specimens).

	Ova deposited	Embryonal Period	Emergence	Instar I	Molt 1	Instar II	Molt 2	Instar III	Molt 3	Instar IV	Molt 4	Development Period: Emergence to adult	Development Period: Ovum to adult
1904 Experiment	July 3 ?	10 days 12 "	July 13 " 15	11 days	July 21	Not recor'd	——	——	Not recorded	——	Aug. 31	49 days 3 ♂ ♂	59 days
1905	Aug. 20 ?	8 days	Aug. 28 " 29 " 31	4 days 4 " 2 "	Sept. 1 " 2	3 days 4 "	Sept. 5 " 6	3 days 3 " 5 " 6 " 6	Sept. 8 2 " 9 3 " 10 2 " 11 4	4 days 7 "	Sept. 12 1 " 16 1 " 17 2 " 18 2	Not bred 14 days 17 " 18 " 19 "	5 ♂ ♂ 1 ♀ ?
1905	Aug. 26	13 days 15 " 26 " 23 "	Sept. 8 " 10 " 21 " 18	9 days 8 "	Sep. 27 " 26	6 days	Oct. 1	5 days	Oct. 6	6 days	Oct. 12 ♂ in morning ♀ in afternoon	28 days	48 days
1908 Controlled Experiment	Jl. 6 A I A-II A-III	7 days	July 13	6 days 7 days	Jul. 19 July 20	2 days 3 " 4 "	July 21 " 22 " 23	3 days 5 " 4 "	July 24 " 27 " 27	4 days 4 " 10 "	July 28 " 31 Aug. 6	15 days 18 " 24 "	22 days ♂ 25 " ♂♀ 31 " ♀

This instar is between three and six days long, but most took three days.

The male nymph was distinguishable in this instar by the more pointed abdomen.

Fourth (and Last) Nymphal Instar.—Antennae noticeably more slender but not so long in proportion; proportional length of joints as before; joints nearly of equal thickness except 1 and 2 a little stouter, 4 fusiform, pointed, all set with pile and long hairs. Rostrum as before, except that it is more slender and longer, reaching first coxae. The legs are also longer and more slender; first femora longer and thinner than tibiae, intermediates subequal and hind tibiae slender and longer than femora. In the cast skins the curvature of the hind tibiae of the male begins to be noted. All tarsi are still 1-jointed without any sign of a suture, although 2-jointed in the adult. Pro- and mesothorax are distinct. Abdomen is much longer, nearly equal in length to the thorax, pointed, male genital segment prominent; general form is oval.

This instar lasted between four and ten days, the majority molting in 4. This brings the insect to the adult, as noted.

While emerging from the cast skin in this last molt and directly after, *M. borealis* is very white with brown markings. The head is tinged with brownish with a white median line; the thorax is whitish; the first and second abdominal segments are brown to within a quarter of their width of the connexivum; the third, fourth and fifth are more narrowly marked, and the 6th and 7th are brown to the connexivum. The connexivum has a brown edge at the inner margin narrowing cephalad and caudad. The black and dark bluish grey mature coloration is attained fully in not over ten hours. The eyes at moulting, however, are nearly black and very conspicuous by contrast.

This little insect is comparatively simple to rear and its smallness makes it an excellent object to examine living under the microscope. Much remains to be found out about it. What is its respiratory system? Where are its spiracles, unrevealed even in the cast skins? How many eggs does each female lay? Many other questions will occur to the experienced biologist, unanswered in what precedes.

PLATE XXV.

Life History of Microvelia borealis Bueno.

Ova
Nymph First Instar
" Second "
Nymph Third Instar
" Fourth "
Adult Male

all X 20. Microphotographs by Mr. Chris. E. Olsen.

A new Species of Myrmecophilous Blattid. (Orthoptera; Blattidae; Corydiinae).

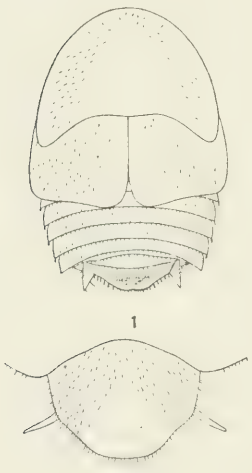
By Morgan Hebard, Philadelphia, Pa.

Recently specimens of a species of roach were sent us by Professor W. M. Wheeler, which are found to represent a new species of the genus *Myrmecoblatta* Mann. This genus was placed in the Blattinae, the valvular type of female subgenital plate, in part, being responsible for this assignment. The unarmed ventral femoral margins and other features prevent this association. The genus is clearly nearest *Compsodes* Hebard,[1] and likewise referable to the Corydiinae.

MYRMECOBLATTA Mann.

1914. *Myrmecoblatta* Mann, Psyche, XXI, p. 172.

Genotype, by monotypy, *Myrmecoblatta rehni* Mann, described from Guerrero Mill, Hidalgo, Mexico.



Myrmecoblatta wheeleri new species. Type, ♂.
Fig. 1.—Dorsal view. (x 10.)
Fig. 2.—Ventral view of subgenital plate (greatly magnified).

The following generic features should, in our opinion, be emphasized: Surface of insect supplied with moderately numerous, short, minute hairs. Ocelli absent. Antennae with first joint large, about twice as long as broad; second joint not as wide, subquadrate; third joint slightly longer than wide; succeeding ten joints not as long as wide.[2] Maxillary palpi with distal joint nearly twice as long as penultimate joint, distal truncation weakly oblique. Clypeus produced, with apex bluntly rounded, concealing the mandibles. Pronotum with disk evenly convex, lateral (and cephalic in male) portions weakly concave; pro-

[1] 1917. Mem. Am. Ent. Soc., 2, p. 208.

[2] One specimen before us, with a complete antenna, shows twenty-five joints in all.

notum extending considerably beyond the head in male, leaving the vertex briefly exposed in female. Tegmina present, reduced, with venation subobsolete, in male; absent in female. Wings greatly reduced in male, absent in female. Cerci tapering to acute apex. Subgenital plate of male symmetrical, with similar, simple, straight, elongate, cylindrical styles, situated in sockets latero-distad, with distal margin of plate between these somewhat produced, convex.[3] Subgenital plate of female valvular, with basal margins of valves straight, convergent, to the rather broadly rounded apex.[4] Ventral femoral margins unarmed, supplied with a few scattered hairs; median and caudal femora supplied with a rather delicate disto-dorsal genicular spine.[5] Tibiae with external faces supplied with numerous short bristles, median and caudal tibiae there furnished with a few spines; all of the tibiae armed with distal spines. Tarsal joints elongate and slender, those of the caudal limbs nearly equaling the caudal tibiae in length. Caudal metatarsus fully as long as the remaining joints. Pulvilli and arolia absent.

Myrmecoblatta wheeleri new species.

Compared with *M. rehni,* the male of the present species is found to differ in the pronotum, with latero-caudal angles more sharply rounded; shorter and truncate tegmina; more reduced wings; much shorter supra-anal plate and much shorter cerci, with articulations subobsolete. From the single immature female of the present species before us we can only determine that females of *wheeleri* are separable from those of *manni,* as are males, by the much reduced cerci, with articulations subobsolete.

TYPE: ♂; San Lucas Toliman, Solola, Guatemala. January 3, 1912. (W. M. Wheeler.) [Hebard Collection, Type No. 440.]

[3] In these features showing considerable resemblance to the Corydiine genera, *Compsodes* and *Latindia.* These genera, in these respects, showing a similarity to the normal Blattinid type.

[4] In this respect much closer to the normal V acute-angulate type found in the Corydiine genera, *Holocompsa* and *Compsodes,* but showing some divergence toward the type normal in the Blattinae.

[5] Mann failed to note the absence of the genicular spine on the cephalic femora, a condition found throughout the Blattidae.

Description of Type. Size minute, form broad elliptical. Head hidden under pronotum, evenly and very weakly convex from occiput to clypeus; interocular space decidedly broader than that between antennal sockets. Pronotum with latero-caudal angles acute-angulate, bluntly rounded; caudal margin rather strongly concave, except mesad where a brief and feeble convexity is indicated. Tegmina subquadrate, distal margin truncate, weakly concave; venation obsolete, except humeral trunk, which is weakly indicated. Wings minute, vestigial, with venation obsolete; anterior field oval, posterior field indicated by vestigial tissue. Dorsal surface of abdomen unspecialized; median segment extremely narrow (longitudinally); first to sixth segments with caudal margins transverse but latero-caudal angles very feebly produced, almost rectangulate, with acute apices each supplied with a bristle; seventh and eighth segments transversely narrower, the eighth with caudal margin broadly convex between the cerci. Supra-anal plate delicate in structure, bilobate, about three times as wide as its greatest length; lateral margins weakly convex convergent, armed with bristles; distal margin briefly acute-angulate emarginate mesad, with lateral portions weakly convex, curling dorsad and supplied with numerous hairs; latero-caudal angles broadly rounded.[6] Cerci conical, extending as far as distal margin of supra-anal plate, apex acute, articulations subobsolete. Concealed genital hook situated sinistrad, elongate and slender, distal portion curved sharply dextrad, forming nearly a semicircle, with apex acute. Subgenital plate broader than long; lateral margins straight, parallel to style sockets, distal portion of plate between these moderately produced with distal margin broadly convex. Styles and limb armament as given in generic diagnosis. Pulvilli and arolia absent.

A single immature female before us shows the ocular, pronotal and cercal development similar to a male in the same instar. The subgenital plate[7] shows indications of a distal medio-longitudinal sulcation, while from within the succeeding segment projects, showing styles similar to those of the male sex.[8]

Measurements (in millimeters).[9]

♂	Length of body	Length of pronotum	Width of pronotum	Total length of tegmen	Exposed length of tegmen	Width of tegmen	Length of cercus
TYPE.....	3.94	1.43	2.84	1.7	1.43	1.63	.34
Paratype....	4.08	1.63	2.85	1.85	1.36	1.56	.34

[6] In texture and many features of contour, similarity with *Compsodes schwarzi* Caudell is found.

[7] See generic diagnosis. In adult females of this species there is little doubt but that this plate is much as in *rehni*.

[8] This condition in immature females has been observed in other forms of the Blattidae.

[9] Taken under the microscope.

Coloration. General coloration cinnamon brown, shading to ochraceous-buff rather broadly along the lateral margins of the pronotum. Underparts and limbs ochraceous-buff, strongly tinged with buckthorn brown.

In addition to the type, one male paratype and a pair of immature examples are before us. These specimens were all taken at the same time, by Professor W. M. Wheeler, from a colony of the ant, *Solenopsis gemmata* (Fabricius),[10] found under a stone on the shores of Lake Atitlan.

A Second Colletes with Spotted Wings (Hym.).

By T. D. A. Cockerell, Boulder, Colorado.

In 1868 Cresson described a remarkable Colletid bee from Orizaba, Mexico, having black spots on the wings. He called it *Colletes punctipennis.* Cresson had only the female, but a male was found in F. Smith's collection in the British Museum, collected in Guatemala. This I described in Annals and Mag. of Nat. Hist., July, 1914, p. 11. On April 20, 1912, Mr. Aug. Busck collected at Porto Bello, Panama, two males of a species very close to *C. punctipennis,* but with the thoracic hair very differently colored. It may possibly prove to be only a subspecies, but as no intermediates are known it is given the specific rank which it probably deserves.

Colletes spiloptera n. sp.

♂. Length about 11 mm.; wings as in *C. punctipennis,* but the rather short hair of thorax above, and of tubercles, bright fox-red (in *punctipennis* the thorax is clothed with short, dense white or hoary pubescence, that on mesothorax shortest and mixed with sparse black hairs, giving the surface a maculate appearance; scutellum with short black pubescence, margined entirely with whitish). Only middle of flagellum (joints 5-9) red beneath; mesothorax very densely punctured; second abdominal segment with punctures conspicuously smaller and denser than on first; genitalia with sagittal wings very large and rounded, stipites covered on apical part with short yellowish hair, but without any long spreading bristles. The malar space is much broader than long.

Type in the U. S. National Museum.

[10] Determined by Professor W. M. Wheeler, to whom we take pleasure in dedicating the interesting myrmecophilous roach here described.

Notes on the Construction of the Cocoon of Praon (Hym., Braconidae).

By C. N. Ainslie, U. S. Dept. Agriculture, Bureau of Entomology, Cereal and Forage Insects.*

The parasites of various aphids have been receiving much attention during recent years and their widely differing habits have proved most interesting to the students of their life histories.

In a short sketch in *Entomological News* of March, 1909, pp. 110-112, the writer described briefly a discovery he had recently made of the process by which the bodies of aphids, killed by the attack of their Aphidiine enemies, are fastened by the larvae of the parasite to a firm base, thus affording the larvae a reasonably secure shelter during the period of pupation. This discovery was made by using the exceedingly simple device of inverting upon the stage of a microscope a slide on which the aphid was being glued after the larva had split ventrally the abdomen of its dead host. Through the slide thus placed the movements of the larva could be readily watched as it smeared the torn edges of the aphid's body-wall to the glass with a generous supply of a viscous fluid. Previous to this observation, made nearly nine years ago, no one seems to have been able to solve the mystery of this attachment of the dead body, although the entire operation had frequently been carefully watched, from above. The process as then detailed has been since confirmed by Mr. E. O. G. Kelly, of the Bureau of Entomology, and by other observers as well. It appears to be a well established fact that nearly all the braconid parasites of aphids fasten their former hosts to a base in much the same manner.

On the other hand the *Aphelinus*-parasitized bodies of aphids are anchored without the abdominal rent. Just how this is accomplished is not yet definitely known since it can be learned only by means of circumstantial evidence. It seems likely that a certain amount of an adhesive fluid is in some manner forced through the stomata or other pores in the body-wall and thus

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the ventral surface is glued fast to its support. Inasmuch as the Aphelininae attack only the short-legged and smaller-bodied species of aphids, it must be much easier for their larvae to anchor the bodies of their hosts than for those parasites that prey on the longer-legged forms like *Macrosiphum* and *Rhopalosiphum*. But even these larger forms are often fastened to leaves and grain blades by their internal parasites. As the process has never been watched, so far as I know, the exact means used to bring the abdomen to a junction with the leaf on which the aphid stands is unknown, but is probably simple enough when once understood.

An exception to this common practice among braconid parasites is that of the genus *Praon* which attacks the larger aphids. In Insect Life, Vol. IV, p. 196, 1891, Dr. Howard calls attention to the fact, often since observed, that the larva of *Praon* constructs a tent-like cocoon beneath the body of its host for a pupation chamber. An opportunity was afforded the writer during the summer of 1916 to watch the entire process of constructing this cocoon, and the details are presented herewith.

July 15, 1916, a parasitized apterous *Macrosiphum pisi* was taken on a leaflet of white clover just as the larval guest within its body had deprived it of the power of motion. The dying aphid, still standing on the leaflet, was placed within a small vial where it would be undisturbed and could be easily observed without interruption.

Scarcely had it been secured in this way when the abdomen of the aphid was rent ventrally by the activity of the imprisoned larva. But the long sprawling legs of the aphid made it clearly impossible to cement the body to the leaf and the problem before the larva was to somehow bridge this gap. It thrust its head at once through the opening and appeared to be carefully investigating the situation. Without entirely leaving the cavity of the aphid's body it swung its flexible head about, not aimlessly as it very soon proved, for in less than five minutes it was busily at work to form its cocoon. Touching the surface of the leaf with the tip of its pointed head, it spun a fine silk thread, attached to the leaf at its lower end, and attempted

to make the upper end fast to the under side of the aphid's body, but failed to make it adhere. Again and again it made the same effort, but for some reason, perhaps because the supply of silk was insufficient, not a single strand spanned the gap. It labored vigorously, rotating an entire circle in its anxiety to succeed. All the while the cauda, and at times half of its body, was hidden from view within the aphid's body, to which it yet clung. For nearly fifteen minutes it twisted and turned, then seemed to grow weary of its fruitless efforts and withdrew entirely inside the body of the aphid.

After a rest of about ten minutes it once more showed its head outside, followed again by nearly the entire body, retaining as before a slight hold by means of the tip of the cauda. This time the spinning was successfully inaugurated and the head went ceaselessly from the leaf to the body above, leaving a ragged and irregular barricade of uneven and perpendicular silk threads arranged in a rude circle. By its serpent-like movements in confined quarters, the larva partly lifted and supported the empty skin of its host on a bend of its writhing body, and as it shifted its position during its slow rotation, the body above rocked like a boat in a gale. Gradually the row of simple upright strands began insensibly to grow more complex, braces stiffened them at the lower end, diagonal threads were occasionally thrown against them and the structure assumed more and more the appearance of a real fabric. The larva worked cleverly, straining the threads at times almost to the breaking point, but never doing any actual damage to its previous work. Never for a moment did it pause in its labor during all the hours it was under observation. It seemed to realize to some extent the meagerness of its resources and the necessity of haste in creating a shelter.

After about two hours of unremitting efforts the structure was near enough completed to justify it in abandoning its former home, so it withdrew its mucilaginous bulk from its birthplace and coiled itself within the mesh of fibers that had been spun. It seemed hardly possible that it could move about in so small a space, but it showed wonderful elasticity and went to work more feverishly than ever, turning slowly around to dis-

tribute the silk evenly on all the uprights. It was impossible not to admire the clumsy skill with which this uncouth creature, for the first and only time in its life, wove its protective screen and overcame the difficulties that hindered the operation.

As more threads were added the fabric became finally so opaque that it was no longer possible to see what was taking place within.

Just at this time another larva began operations beneath its host and the previous observations were easily duplicated.

The adults from both these larvae emerged July 22d, just seven days from the time the larvae began to spin themselves in.

A New Trichodes (Cleridae, Coleop.).

By J. Wagener Green, Easton, Pa.

Trichodes bicinctus n. sp.

Moderately robust, elytra slightly broader behind middle. Color black with greenish lustre, base of antennae, palpi, labrum, legs partly, and sides of abdominal segments, pale. Antennal club reddish varying to dark brown. Elytra reddish or fulvous, with antemedian fascia interrupted at suture, a second and slightly wider fascia at apical third, and apex narrowly, black. The apical black spot is concave anteriorly and produced forward on suture and side margin, sometimes uniting with post-median fascia and completely enclosing a rounded pale spot.

Labrum entire or very slightly emarginate. Antennal club broadly triangular. Front concave. Head and thorax finely, rather closely punctured, the latter with slight median smooth space at base. Pubescence fulvous, moderately long on thorax, short on elytra, longer near scutellum. Elytra coarsely punctate, more finely toward base. Apices rounded in both sexes. Body beneath and legs densely clothed with long white pubescence. Penultimate ventral segment of male broadly emarginate, as usual.

Length 11-12 mm.

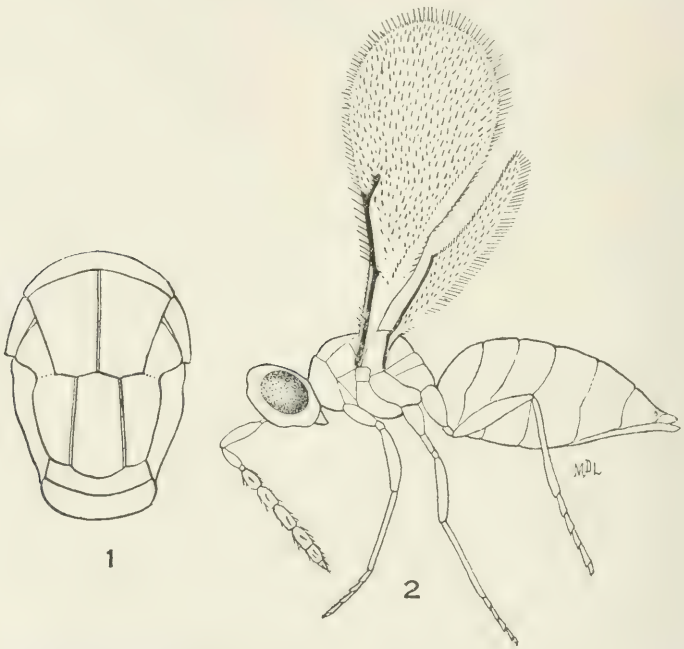
Brewster County, Texas, about twenty miles south of Marfa, July 14 to 25. Two males, a female in the collection of Mr. Wenzel, of Philadelphia. Type in my collection.

Resembles *simulator, apivorus* and *bibalteatus* in style of maculation. Readily distinguished from the last by the apical elytral spot, and from the first two by the pale antennal club. Differs from all in the bicolored legs. The femora are more or less pale beneath at base, the anterior and median tibiae slightly paler at apex in the males, almost entirely reddish in the female.

An Egg Parasite of the Sumac Flea-Beetle (Hym., Chalcid.).

By C. R. Crosby and M. D. Leonard, Cornell University, Ithaca, New York.

Mr. Loren B. Smith, of Norfolk, Virginia, has sent us specimens of a hymenopterous parasite reared by him from the eggs of the sumac flea-beetle (*Blepharida rhois* Forster). The species is apparently undescribed.



Tetrastichus ovipransus n. sp.

♀ Length, 1.2 mm. General color bluish black. Head bluish black, brownish in front of ocelli in alcoholic specimens. Thorax bluish black, very finely longitudinally striolate. Antennae yellowish brown, scape noticeably paler. The relative length of the antennal segments may be expressed by the following ratio: scape 6, pedicel 3, funicle segments 4, 4.5, 4.5, club 10. Ring segment small but distinct. The three-segmented club is of the same width as the funicle segments and pointed at the tip. Coxae and femora, except tip, black, remainder of legs pale straw colored. Abdomen dark brownish with a metallic tinge, especially above.

Described from 14 female specimens reared July 20, 1916, and 3 female specimens reared June 24, 1916, from eggs of *Blepharida rhois*, Norfolk, Virginia.

Types in the Cornell University collection. Type No. 76.

Indian Gall Midges (Cecidomyiidae, Dipt.).

By E. P. Felt, Albany, New York.

The writer has been privileged, through the courtesy of Prof. Ramakrishna, of South India, to study two small collections of gall midges reared or obtained from the vicinity of various grasses. In addition to data given in a preceding paper,* we would record the rearing of the rice or paddy gall midge, *Pachydiplosis oryzae* Wood-Mason, from *Panicum stagninum,* and the capture of adults referable with very little question to this species, in light traps. The specimens taken in early October, 1916, were heavy with eggs. *Pseudhormomyia fluvialis* Felt was reared, in addition to food plants previously recorded, from *Panicum punctatum,* and both this species and the closely related *P. cornea* are here referred to *Dyodiplosis* Rubs. Below we describe one new species and all the stages of a very interesting midge, the adults previously being unknown and tentatively referred to *Oligotrophus* Latr.

Hormomyia ischaemi Kieff.

1910 Kieffer, J. J. Royal Botanic Gardens Kew, Bull., No. 3, p. 71. (*Oligotrophus.*)

Adults and specimens of the gall of this insect, provisionally referred to *Hormomyia,* were received from Prof. T. V. Ramakrishna, Coimbatore, S. India, under date of November 9, 1916, accompanied by the statement that the insects were reared from a gall on *Ischaemum pilosum* and were very likely identical with the species described from the larva and gall by Dr. Kieffer as *Oligotrophus ischaemi,* which latter is probable though not certain. The larva described by Dr. Kieffer, if this species, is evidently a young stage, since the large size of the midges preclude their developing from such a small full-grown larva.

Gall. Length 11 to 18 cm., diameter 3 to 4 mm. This is a reddish, cylindrical tube pointed at the apex and sheathed at the base by scale-like leaves. The interior is hollow for practically its whole length and emergence is through a small hole near the tip (characters in part from L. A. Boodle, p. 70, *l. c.*).

Egg. Length .2 mm., ovate, cylindrical, whitish and apparently pro-

* Ent. News 28:73-76.

duced in great numbers, since several hundred were found in a vial containing a portion of a gall and one dilapidated female.

Larva. It is probable, as stated above, that the whitish larva described by Dr. Kieffer, *l. c.*, p. 71, is a very young stage or does not belong to this species. A free translation of Dr. Kieffer's description follows:

Larva white, length 2 mm., smooth, the spiny warts very fine and situated on the ventral part of the last two thoracic segments and all of the abdominal segments. The papillae are all simple, save the eight terminal ones, which are provided with very short, scarcely distinct hairs; the pleural and sternal papillae are equally large; the mesial pleural papillae arranged in groups of three; the anterior ventral and posterior papillae small and hardly apparent. Antennal segment rounded, deeply emarginate in the middle, dorsally with sparse granulations on the anterior portion, the posterior part nearly smooth; breastbone yellow, large, sessile, as long as large and with two triangular teeth which have a length twice the width of the base and are separated by a broadly rounded emargination.

Exuvium. ♂. Length 5 mm., moderately stout, yellowish transparent, the thoracic horns slender, slightly curved, nearly cylindrical and with a length about five times the diameter. Antennal cases probably extending to the base of the abdomen and with triangular basal processes with a length about three times the diameter of the base and thickened apically; the wing cases reaching to the tip of the second abdominal segment, and the leg cases to the fifth or sixth abdominal segments; the dorsum of the latter slightly chitinized and with an irregular series of three or four transverse rows of chitinous spines.

♂ Length 3.5 mm. Antennae about as long as the body, thickly haired, yellowish brown; 14 segments, the fifth almost trinodose, the stems with a length 1¼ and 1½ times their diameters, respectively; basal enlargement subglobose, with a sparse subbasal whorl of stout setae and a subapical circumfilum, the loops numerous, with a length about half the diameter of the enlargement and forming an almost double row, the latter being true of the middle and distal fili; terminal segment somewhat produced, the basal portion of the stem with a length about twice its diameter, the distal enlargement subcylindric and with a length nearly three times its diameter, and apically a large, fusiform appendage, a rudimentary segment.

Palpi; first segment irregularly ovoid, the second a little longer and stouter, the third more than twice the length of the second and tapering uniformly from a somewhat swollen base. Eyes holoptic.

Mesonotum dark reddish brown. Scutellum concolorous, postscutellum dark reddish brown. Abdomen dark yellowish brown, somewhat variable, the genitalia yellowish; the terminal clasp segment fuscous apically.

Wings subhyaline, brownish, shorter than the body, the third vein uniting with the margin well beyond the apex, the fifth vein joining the posterior margin at the distal fourth, its branch beyond the basal half; halteres yellowish basally, brownish yellow apically.

Coxae reddish brown; legs mostly yellowish brown, the tarsi somewhat darker.

Genitalia; basal clasp segment short, broad, swollen basally; terminal clasp segment moderately long, nearly straight; dorsal plate short, broad, deeply and narrowly emarginate, the lobes narrowly rounded; ventral plate a little longer, broad, broadly rounded apically.

♀ Length 5 mm. Antennae probably three-fourths the length of the body, sparsely haired, dark brown; 14 segments, the fifth with a stem one-fourth the length of the subcylindric basal enlargement, which latter has a length about four times its diameter and low, looped circumfili near the basal third and subapically.

Palpi; first segment irregular, the second a little longer, subquadrate, the third more than twice the length of the second, slender and nearly uniform in diameter.

Mesonotum dark brownish black, the submedian lines sparsely haired. Scutellum and postscutellum concolorous, the former with a few golden hairs apically. Abdomen shining dark brownish black, sparsely clothed with short hairs.

Wings slightly fuscous and only about two-thirds the length of the abdomen, the third vein uniting with the margin just beyond the apex of the wing, the fifth with the indistinct anterior branch joining the posterior margin at the distal fourth and the posterior branch beyond the basal half; halteres yellowish orange basally, fuscous subapically.

Coxae and legs a nearly uniform dark brown; claws moderately stout, strongly curved subapically, simple; pulvilli nearly as long as the claws.

Ovipositor short, the lobes irregularly oval, with a length about one-half greater than the width and rather thickly setose.

Type Cecid. a 2781.

Dyodiplosis andropogonis n. sp.

The species described below was received from Prof. T. V. Ramakrishna, Government Entomologist, Agricultural College and Research Institute, Coimbatore, South India, under date of November 9, 1916, accompanied by a statement to the effect that the midges were reared from galls in a common perennial grass, *Andropogon annulatus,* at Adoni, Bellary District, September 23, 1916, and labeled Y. R. Rao Coll. These insects are similar to though quite distinct from *Pseudhormomyia flu-*

vialis Felt and *P. cornea* Felt, both received earlier from the same correspondent. These last two species are congeneric with the one to be characterized and now referred to the genus *Dyodiplosis*.

♂ Length 2 mm. Antennae one-half longer than the body, thickly haired, yellowish brown; 14 segments, the stems with a length one and one-fourth and two and one-half times their diameters, respectively, the distal enlargement with a length one and three-fourths greater than its diameter and only slightly constricted near the basal third as compared with *D. fluvialis*. The circumfili are fine and moderately long; terminal segment produced, the basal portion of the stem with a length three times its diameter, the distal enlargement cylindric, with a length fully three times its diameter and apically a moderately stout, rather long, conical process.

Palpi; first segment short, irregular, with a length about one-half greater than its diameter, the second a little longer and broader, the third about as long as the two preceding, more slender.

Mesonotum purplish brown, the submedian lines and posterior median areas yellowish. Scutellum and postscutellum mostly pale yellowish. Abdomen sparsely haired, a variable dark brown basally, yellowish brown apically.

Wings hyaline; halteres yellowish basally, light brown apically.

Legs mostly a pale straw.

Genitalia; basal clasp segment moderately long, stout; terminal clasp segment distinctly swollen basally, tapering; dorsal plate deeply and triangularly emarginate, the divergent lobes narrowly rounded; ventral plate long, broad, subtruncate apically, the posterior border slightly and roundly emarginate; style a little longer than the ventral plate.

♀ Length 3 mm. Antennae nearly as long as the body, sparsely haired, dark reddish brown; 14 segments, the fifth with a stem one-third the length of the cylindric basal enlargement, which latter has a length about four times its diameter and sparse whorls of stout setae subbasally and apically; terminal segment hardly produced, the enlargement with a length three and one-half times its diameter and apically a rather broad subconical process.

Abdomen sparsely haired, mostly dark reddish brown, the seventh segment and the lobes of the ovipositor yellowish brown; halteres yellowish basally, reddish brown apically; claws long, rather slender strongly curved apically, the pulvilli a little shorter than the claws.

Ovipositor short, tapering, the lobes with a length over twice the width and tapering irregularly to a narrowly rounded, setose apex. Otherwise as in the male.

Type—Cecid. a 2782.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., OCTOBER, 1917.

The Lack of Entomologists.

The war has resulted in a great demand for men and women trained in many lines of work. Many activities which the times have brought into being will doubtless meet with such approval as to insure their continuance after the fighting has ceased. As in other fields of science, the present supply of entomologists does not meet the demand.

Mr. V. I. Safro, of Louisville, Kentucky, as quoted in Report No. 3 of the Emergency Entomological Service (U. S. Dept. Agric.), calls attention

> to the difficulty of obtaining adequately trained men for emergency entomological work and suggests the advisability of giving them special training. . . . Many of the standard recommendations apply to conditions in gardens or in small cultures and do not necessarily apply to the conditions in various regions where very extensive cultures of onions and similar crops are undertaken. . . . Growers want to know not only how to combat certain insect pests but [also] how certain operations can be economically combined with other operations. To meet this important situation, extension entomologists should be . . . thoroughly acquainted with the control of plant diseases as well as insect pests and the mechanical equipment necessary for effective work. Too often our economic entomologists ignore the fact that their recommendations cannot possibly be conducive to the best results unless they know and explain how growers can combine fungicides with insecticides, thereby reducing one of the main items of expense, the labor. Many growers will not spray at all for certain insects unless they know that the insect spray can be combined with Bordeaux or some other fungicide.

Again Dr. T. J. Headlee, State Entomologist of New Jersey, says (in Report No. 4 of the same series) of the farm demonstration service in that State:

> The greatest weakness of the whole service is the lack of trained men to do sufficiently thorough entomological scouting. This lack is a real handicap because outbreaks of considerable proportions are sometimes not thoroughly appreciated until they are about ready to occur and this means that a good many growers will be unable to get materials and machinery in time to do effective work.

There would therefore seem to be great opportunities for useful service to the nation in applied entomology and encouragement to those who may be thinking of an entomological career.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Sex Attraction Overcome by Light Stimulation (Lepid., Col.).

Those who are familiar with Fabre's delightful stories in "The Life of the Caterpillar" will remember that he was greatly exercised in endeavoring to account for the facility with which the male moth will recognize from a great distance the existence of his mate. The usual theory of the operation of the sense of smell was to him utterly unsatisfactory.

Many years ago I was astonished at the great number of male Cecropia that came to a cage in which I had females confined. By referring to my statement in the ENTOMOLOGICAL NEWS of May, 1895, I find that in addition to the number destroyed by robins and cats, the wings being the principal part of the debris left, I counted three hundred and forty-two specimens taken in four nights. I am reminded of this old story by a recent experience.

For many years *Telea polyphemus* has been in this immediate neighborhood an exceedingly rare insect. Last autumn I had given me a few Polyphemus cocoons gathered from trees some ten or fifteen miles distant. When recently the moths began to emerge, I left two females in a cage on my back porch for several nights, and while the number of arriving and inquisitive males (eighteen in all) was not large, as compared with my previous Cecropia experience, there was one curious feature in connection with their advent, on which I should be glad to hear Fabre philosophize if he were still with us. I have every reason to believe that the male moths came to my lure from a considerable distance. When they arrived, or possibly soon afterward, they discovered, only five or six feet from the cage in which were confined the females they were doubtless seeking, an electric light illuminating my insect trap which, except on brilliant moonlight nights, attracts all sorts of nocturnal hexapods. Their attention seems to have been thus distracted from their previous quest and instead of going to the cage, or remaining there, if possibly they reached it, they all without exception made their way into the trap from which they could not escape. The brilliant light seems to have had so strong an influence upon them as to have counteracted their previous inclination rendering it powerless. It was also very noticeable that the *wild* moths, with but a single exception, were smaller than those hatched in captivity, a circumstance possibly indicating a less abundant or a less invigorating food-plant on which the larvae had been feeding.

My insect trap disposes of a great many *Lachnosterna*. Within the

last few nights (mid-June, 1917) it has taken one hundred and eighty-one *futilis,* but there have been caught only three *rugosa,* while *fusca,* usually most abundant, has not been represented at all.—O. S. Westcott, Oak Park, Illinois.

Emergency Entomological Service.

Numbers 3, 4 and 5 of the reports of the Emergency Entomological Service, United States Dept. of Agriculture, "Reporting cooperation between Federal, State and Station Entomologists and other Agencies," have appeared since the preceding issue of the News. They are dated July 1, August 1, and September 1, and consist of 21, 28 and 25 mimeographed pages, respectively.

Among their more important contents are notes of new legislation in Illinois whereby the State Dept. of Agriculture has authority to compel owners, or other occupiers, of property infested by insect pests or plant diseases to take measures to arrest or prevent the same under penalties (upon conviction) of fines of $10 to $100 for each and every offense; the establishment of an Insect Pest Survey and Information Service by Dr. E. P. Felt, under the New York Food Supply Commission (a description of the workings of this Survey by Prof. C. R. Crosby is given in No. 4); a similar survey in Ohio under Prof. H. A. Gossard; the use of farm demonstrators in practically every county in New Jersey, reported by Dr. T. J. Headlee, and in Tennessee under Mr. G. M. Bentley; a systematic educational campaign in Mississippi leading up to "Spray Your Orchard Week," December 9-15, 1917, to be so designed by proclamation of the Governor.

The Food Production Act, approved by President Wilson August 10, 1917, appropriates $441,000 "for the prevention, control and eradication of insects and plant diseases injurious to agriculture, and the conservation and utilization of plant products." Of this sum $145,775 has been allotted to the Bureau of Entomology. A statement is given in No. 5 of the way in which it is proposed to expend this sum. "It is contemplated to inaugurate the present fall an extensive campaign against the Hessian fly and to undertake work on a large scale in the control of insects injurious to stored grains, peas, beans and stored products generally. During the winter, work in dormant tree spraying for scale insects, fumigation of citrus trees and similar activities will be actively pushed. . . . Never before in the history of economic entomology in this country have there been funds to carry, on so large a scale directly to the farmer, fruit grower, stock man and others, practical instruction in the treatment of insect pests."

Reports on insect injuries in 15 States are given in No. 3, in 25 States in No. 4, and in 21 States in No. 5. Among the insects whose depredations have been more serious are:

Grasshoppers in California, western Montana (the Rocky Mountain migratory locust), Nebraska, North and South Dakota, Iowa, southern Indiana, Michigan, the District of Columbia, New York, Vermont and Connecticut;

Hessian fly in eastern Kansas;

chinch bug in Oklahoma and southwestern Illinois;

wireworms (*Melanotus* larvae) in Montana, Idaho and eastern Nebraska;

aphids on barley in southern Arizona, on melons in Nebraska and the Gulf region from Florida to Texas, on conifers in Colorado, on potatoes and tomatoes in Kentucky, New Jersey, Ohio, Pennsylvania, Virginia and Massachusetts, on cabbage in Nebraska, Missouri, New Jersey and Iowa and aphids generally in gardens in cities of Indiana planted on ground which has not been in cultivation for a number of years;

plum curculio in northeastern Ohio and New Jersey (but not in West Virginia or Georgia);

the sheep bot in Mississippi;

the mole-cricket in coastal South Carolina;

red spider in North Carolina on cotton, in Texas on beans and alfalfa;

cut worms in Indiana;

southern corn root-worm beetle (*Diabrotica 12-punctata*) in western Illinois;

lesser corn stalk borer (*Elasmopalpus lignosellus*) in the Gulf States, particularly Mississippi;

boll weevil in Florida, southern and central Texas and Arkansas;

sod web-worms (*Crambus* species) in northern Illinois;

fall web worms (*Hyphantria* spp.) in Louisiana, Mississippi and New York;

white-marked tussock moth in eastern Nebraska, New Jersey, Ohio, Indiana, Connecticut and many other States; other foliage insects are also noted;

seed corn maggot (*Phorbia fusciceps*) in New York;

Colorado potato beetle in Virginia, Wisconsin, Arizona and Missouri, although reported as not very destructive elsewhere.

"The area infested by the alfalfa weevil is producing the only good first crop of alfalfa seen there in five years."

The "surplus of arsenate of lead and Paris green in the country is very low;" arsenate of lime is being substituted for arsenate of lead in Nova Scotia, arsenite of zinc for Paris green in Montana, at a large saving.

Decrease in the natural insect enemies of coniferous bark beetles

(*Dendroctonus*) in the Pike's Peak region of Colorado is especially noticeable. On the other hand, parasitic flies (*Sarcophaga*) attacking grasshoppers are increasing in Montana.

"The destructive result of the hot weather in Southern California [June 14-17: 115-120 deg. F.] against citrus pests has been about equivalent to a season's insecticide treatment." "The unusual amount of rain in the spring" in northeastern Louisiana "gave rise to an unusually high density of malaria mosquitoes early in the season with a consequent early appearance of active cases of malaria." This was followed by "lack of rain and high temperatures operating on both the larvae in the breeding places of these mosquitoes and the activity of the adults. The reduction in the active cases of malaria is already apparent." An "unprecedented number of fleas" (4 species) reported from the vicinity of Dallas, Texas, is believed to have been "correlated with the rather uniform distribution of rainfall during the spring months and probably a high humidity."

One of the largest flights of may-beetles (*Lachnosterna*) experienced in several years covered the entire State of New Jersey.

Copies of all entomological literature, as letters, special bulletins, circulars, press-notices, posters, etc., issued by State and Station entomologists, State Councils of Defense, Boards of Health and other bodies in connection with the present war emergency, are requested by the Bureau of Entomology at Washington, in order that as complete a file as possible may be preserved for reference use in its library.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new species are all grouped at the end of each Order of which they treat. Unless mentioned in the title, the number of the new species occurring north of Mexico is given at end of title, within brackets.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

3—The American Naturalist. **4**—The Canadian Entomologist. **5**—Psyche. **8**—The Entomologist's Monthly Magazine, London. **11**—Annals and Magazine of Natural History, London. **12**—

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Doings of Societies.

Entomological Section, The Academy of Natural Sciences, Philadelphia.

Meeting of March 22, 1917. Twelve persons present. Vice-director R. C. Williams, Jr., presiding.

Lepidoptera.—Dr. Skinner reported on, and exhibited a collection of moths collected and presented by Mr. Morgan Hebard, which contained over 1800 specimens. Especial attention was called to the excellent condition of the material. The collection was made in the summer of 1916, by the aid of a 300-watt electric light, on the porch of a cottage at Hot Springs, Virginia. A vote of thanks was given Mr. Hebard for his generous donation, and Dr. Skinner was complimented on the perfect preparation of the specimens.

Orthoptera.—Mr. Rehn exhibited a series of *Paratettix* presented to the Academy by Dr. Nabours, illustrating his studies on inheritance of color patterns in the genus. The true breeding forms and simple and multiple hybrids were represented in the splendidly preserved material. Mr. Hebard made some remarks on his collecting experiences in Royal Palm Key, Florida. He exhibited some Orthoptera collected and showed some photographs of the habitat of some of the species. He called attention to the difficulty in collecting the walking stick *Aplopus mayeri* on account of its close resemblance to the branches and twigs of the bush on which it feeds. It was only by looking for them at night, by flash light, that the adults could be located.—E. T. Cresson, Jr., *Recorder.*

Feldman Collecting Social.

Meeting of March 21, 1917, at the home of H. W. Wenzel, 5614 Stewart St., Philadelphia. Seven members were present; President H. A. Wenzel in the chair.

Lepidoptera.—Mr. Daecke exhibited *Scopelosoma sidus* Gn. collected by Prof. Sanders in a railroad train at Philadelphia II-26-17.

Coleoptera.—Mr. H. W. Wenzel exhibited the form of *Cicindela hirticollis* Say so common on the New Jersey shore and the extremely large form from Narragansett Pier, June to Sept., 1916. Also the immaculate form *nigrita* Davis, now known as *rhodensis* Calder, from same place Aug. 21, 1916; *Euphoria subtomentosa* Mann. from Nogales, Sta. Cruz County, Arizona, VIII-12-16, F. W. Nunenmacher collector; *Gymnopyge hopliaformis* Linell, Palm Springs, California, III-29-16, C. L. Fox collector, and *Oncerus floralis* LeC., Palm Springs IV-1-16.

Adjourned to the annex.—Geo. M. Greene, *Secretary.*

American Entomological Society.

Meeting of April 26, 1917, in the hall of the Academy of Natural Sciences of Philadelphia, Dr. Henry Skinner, President, in the chair. Eleven members and associates of the Entomological section of the Academy present.

The Secretary read a letter from Dr. L. O. Howard, of the U. S. Department of Agriculture, Washington, D. C., requesting entomologists to report the discovery or presence of insect pests.

Odonata.—Mr. Laurent exhibited specimens of *Tramea carolina* and *Epiaeschna heros,* collected in Gulf Hammock, Florida, during last March. The speaker stated that *carolina* was exceedingly abundant on bright, sunny days, but disappeared towards twilight, when the species would be replaced by large numbers of *heros.* On cloudy days hardly a specimen of *carolina* was to be seen, but *heros* would be flying everywhere.

The meeting then adjourned to listen to an interesting talk by Dr. Skinner on the early entomologists illustrated by portraits thrown on the screen.—R. C. Williams, Jr., *Recording Secretary.*

Butterfly Club Organized in Los Angeles.

On the evening of May 30th, Dr. John Comstock, Curator of the Division of Entomology, Southwest Museum, Los Angeles, California, addressed an audience on the subject of "Butterfly Collecting."

The talk was illustrated by Paget & Autochrome slides from the collection of Dr. Dain L. Tasker. It was in the nature of a popular address, and was given as a part of the extension program of the museum.

Following the lecture, an association was formed as a department of the museum, for the furtherance of entomological interests in the southwest. The purpose of this organization is to popularize the study of the Lepidoptera, and to make the work of the specialists in this line more accessible to the laity. It is felt that in this manner converts may be made to the ranks of the scientific Lepidopterists, such as could not be brought about by an organization of technically trained specialists.

OBITUARY NOTES.

A notice of the life of the Rev. Octavius Pickard-Cambridge, who died at Bloxworth, Dorset, England, March 9, 1917, is given in the *Entomologist's Monthly Magazine* (London) for May, 1917. He was born in the same locality November 3, 1828, and was Rector of Bloxworth from 1868 to his death. He graduated from the University of Durham in 1858 and had studied law in London previous to entering the ministry. His publications dealt mainly with the Arachnida: on the Spiders of the Second Yarkand Mission, of the Challenger expedition, of Dorset (but including those of all Britain), of a large part of those described in the *Biologia Centrali-Americana;* monographs of the British Phalangida and Chernetidae, etc. He possessed an extensive collection of British Lepidoptera, especially the micros, largely gathered by himself. He must not be confused with his nephew, Frederick Octavius Pickard-Cambridge (1861-1905), who also wrote extensively on Arachnida and was a collaborator on the *Biologia.*

Mrs. Helen Grier LeConte, widow of Dr. John L. LeConte (1825-1883), the noted entomologist, died in Philadelphia, September 3, 1917, in her seventy-fifth year, at the home of her son, Dr. Robert G. LeConte, a trustee of the University of Pennsylvania and a member of the Council of the Academy of Natural Sciences.

Corrections.

Page 335, this volume, line 5, for "1911" read "1917."

The numbers of Plates XXII and XXIII should be transposed.

EXCHANGES.

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

For Exchange—Duplicate Rhopalocera from Japan and Formosa; Desiderata: butterflies of the world. S. Satake, No. 48 Aoyamaminamimachi 5-chome, Akasakaku, Tokyo, Japan.

Wanted—Diurnal Lepidoptera of the World. I can offer in exchange a large list of species, particularly southwestern forms.—Dr. John A. Comstock (Curator, Div. of Ent., Southwest Museum), 1275 Bellevue Avenue, Los Angeles, California.

Ozark—Catocalae, over 30 species and forms; Sphingidae, other moths and butterflies, and other insects for suitable exchange.—Auburn E. Brower, R. 2, Willard, Mo.

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tatricus Mill.
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766.—**Hebard** (M.).—A contribution to the knowledge of the Dermaptera of Panama. [5 n. g., 6 n. sps.]. (**43,** 301-334, 1 pl., '17) ..... .54

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WOOD INSECT BOX.—We do not assert that this wooden box has all the qualities of the metal box, especially in regard to safety from smoke, fire, water and dampness, but the chemically prepared material fastened to the under edge of the lid makes a box, we think, superior to any other wood insect box. The bottom is cork lined. Outside varnished. For catalogue and prices inquire of

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